Remarks

I. Support for Amendments

The amendment to the paragraph starting at page 38, line 5 was suggested by the Examiner. Applicants have hereby amended the ATCC address as requested.

Support for the amendment to the paragraph starting at page 38, line 25 can be found in the ATCC deposit receipts that are submitted herewith. *See* Exhibit A. The amendment merely corrects the ATCC Accession Number given to *E.coli* containing plasmid pAH342, and thus adds no new matter.

Support for the amendment to the paragraph at page 60, line 20 can be found at page 60, lines 36-37 and Figure 4. The amendment merely corrects an inadvertent typographical error by reciting the correct range of molecular weight of the rHMW excised from the gel. The correction is obvious upon consideration of the support found in the specification as filed and adds no new matter.

Support for the amendments to the claims can be found throughout the specification. In particular, support for claim 28 can be found at page 12, line 32 - page 13, line 8. The status identifier listed for claim 28 is pursuant to the Official Gazette Notice published on July 5, 2005. Support for claims 29-57 can be found at page 11, line 17-page 12, line 24 and page 24, line 13-page 25, line 26. Support for claims 58-59 can be found at page 11, lines 17-26 and at page 61, line 1 - page 63, line 20.

II. Status of the Claims

Reconsideration of this Application is respectfully requested.

By the foregoing amendments, claims 1-27 are canceled without prejudice to or disclaimer of the subject matter therein, claim 28 is amended, and claims 29 to 59 are sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Upon entry of the foregoing amendment, claims 29-59 are pending in the application, with claims 29, 42, and 50 being the independent claims.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

III. Summary of the Office Action

In the Office Action dated June 22, 2006, the Examiner has made one objection and four rejections of the claims. Applicants respectfully offer the following remarks concerning each of these elements of the Office Action.

IV. Objection to the Specification

At page 4 of the Office Action, the Examiner has objected to claims 26-27 because "generally antibodies 'bind' to polypeptides." Solely to advance prosecution and not in acquiescence to the Examiner's objection, claims 26-27 have been canceled, thus rendering the objection moot. The new claims are phrased to read "an isolated antibody or antigen-binding fragment thereof which specifically 'binds' to a polypeptide...." Therefore, as the objection may be applied to the newly added claims, it has been

addressed and accommodated. Reconsideration and withdrawal of the objection is respectfully requested.

V. The Rejection Under 35 U.S.C. § 101 Has Been Accommodated

The Examiner has rejected claims 26 and 27 under 35 U.S.C. § 101 because the claims allegedly read on a product of nature and then suggested a limitation to distinguish the claimed subject matter from an antibody found in nature. Solely to advance prosecution and not in acquiescence to the Examiner's rejection, Applicants have canceled claims 26 and 27 and have added new claims 29 to 59 that recite an "isolated antibody or antigen-binding fragment thereof" as the Examiner has suggested. Support for the amendment is found at page 34, lines 4-16. Accordingly, this rejection has been accommodated. Reconsideration and withdrawal of the rejection is respectfully requested.

VI. The Rejection For Lack of Written Description Under 35 U.S.C. § 112, First Paragraph, Is Traversed

The Examiner has rejected claims 26 and 27 under 35 U.S.C. § 112, first paragraph as allegedly containing subject matter which was not described in the specification in such a way as to "reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention." Office Action at page 5.

Applicants respectfully disagree with this rejection. However, to expedite prosecution of the present application and not in acquiescence to this rejection, claims 26

and 27 have been canceled without prejudice or disclaimer, thus rendering moot this rejection. However, Applicants respectfully traverse this rejection, as it may be applied to the newly added claims.

The test for the written description requirement is whether one skilled in the art could reasonably conclude that the inventor had possession of the claimed invention based on the specification as filed. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 U.S.P.Q.2d 1111, 1116 (Fed. Cir. 1991); M.P.E.P. § 2163.02. The Federal Circuit has specifically noted that "as long as an applicant has disclosed a 'fully characterized antigen,' either by its structure, formula, chemical name, or physical properties, or by depositing the protein in a public depository, the applicant can then claim an antibody by its binding affinity to that described antigen." *Noelle v. Lederman*, 355 F.3d 1343, 1349, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004) (emphasis in original).

The Examiner argues that the claims directed to fragments or variants of SEQ ID NO: 1 or SEQ ID NO: 2 "do not appear to have sufficient structural characterization and lack any identifying characteristics (function)" because the fragments or variants are allegedly "not disclosed by this specification." Office Action at page 8. Applicants respectfully disagree. The specification as filed discloses fragments. In particular, the specification at page 52, lines 2-7 as amended shows isolation of plasmid pJJ36-J and further describes the plasmid as following:

> Plasmid pJJ36-J was one recombinant derivative isolated by these procedures and is represented by nucleotide 466 to 1976 in figure 2. The deduced amino acid sequence of the truncated fragment of HMW protein is represented by amino acids 29-533 in Figure 3 and is listed as SEQ ID No. 17.

Furthermore, Applicants assert that the specification discloses variants that are 95% identical to SEQ ID NO: 2. In particular, Figure 6 shows a sequence comparison of HMW polypeptide variants that are 95% identical to SEQ ID NO: 2. The amino acid sequence of the HMW polypeptide variant from *C. trachomatis* F serovar is 96.8% identical to SEQ ID NO: 2 and is listed as SEQ ID NO: 15. The amino acid sequence of the HMW polypeptide variant from *C. trachomatis* B serovar is 96.8% identical to SEQ ID NO: 2 and is listed as SEQ ID NO: 16. Furthermore, the specification as originally filed discloses methods of establishing or determining sequence variation of the variants of *C. trachomatis* HMW protein in Example 8 at page 53, line 32-page 56, line 15.

The Examiner has further stated that "the specification fails to disclose any substitution, insertion, or deletion or change in SEQ ID NO: 1 or SEQ ID NO: 2 to obtain a variant[] such as isolated polypeptide having 95% identity to SEQ ID NO: 1 or SEQ ID NO: 2 or fragment of said sequences." Office Action at page 8. Applicants respectfully disagree. The specification clearly shows and lists amino acid sequences that have an insertion, deletion, or modification of the amino acid residues in SEQ ID NO: 2 or fragments of said sequences. For example, SEQ ID NOs: 15 or 16 have an amino acid insertion between amino acid residues 50 and 51 of SEQ ID NO: 2. The specification as filed further describes methods of making such variants at page 8, line 3 to page 9, line 25. Furthermore, the specification as filed also describes methods of determining the sequence variation of the variants in Example 8 at page 53, line 32-page 56, line 15. The methods not described therein are known in the art and readily available to a person of ordinary skill in the art.

Thus, Applicants respectfully assert that a person of ordinary skill in the art would understand that Applicants were in possession of not only full-length *C. trachomatis* HMW polypeptides but also fragments and variants thereof. Accordingly, reconsideration and withdrawal of the written description rejection under 35 U.S.C. § 112, first paragraph, is respectfully requested.

VII. The Rejection For Lack of Enablement Under 35 U.S.C. § 112, First Paragraph, Is Traversed

The Examiner has also rejected claims 26 and 27 under 35 U.S.C. § 112, first paragraph as allegedly not being enabling for antibodies or monoclonal antibodies that specifically bind to the fragments/variants of the polypeptide disclosed in the application.

As an initial matter, the Examiner has indicated that the specification is enabling for the following:

> isolated antibody or isolated monoclonal antibodies that specifically bind to a high molecular weight polypeptide of a *C. trachomatis* serovar L2 which antibodies are present in antisera raised against an immunogenic composition comprising the polypeptide selected from the group consisting of (a) isolated high molecular weight polypeptide of a *Chlamydia trachomatis* L2 said polypeptide encoded by the nucleic acid sequence SEQ ID NO: 1 (b) isolated high molecular weight polypeptide of a *Chlamydia trachomatis* L2

Office Action at pages 9-10. Accordingly, Applicants assert that newly added dependent claims 30-35, 43, and 51 are enabled.

The test for enablement is whether the disclosure when filed contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention. *In re Wands*, 858 F.2d 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1988). The standard applied is whether the

experimentation needed to practice the invention is undue. *Id.* However, "[a] patent need not disclose what is well known in the art." *Id.* Whether the specification is enabling must be analyzed in light of factors such as the state of the prior art and the level of one of ordinary skill. *Id.*

The Examiner argues that "the specification fails to provide an enabling disclosure for the full scope of claimed antibody or monoclonal antibody that specifically bind to isolated polypeptide fragments/ variants SEQ ID NO: 1 or 2 because it fails to provide any guidance regarding how to make and use claimed antibody that bind to unknown fragments/ variants." Office Action at page 10.

Applicants respectfully disagree. First, the specification provides clear and unambiguous guidance about the specific sequences of the fragments and variants that are 95% identical to SEQ ID NO: 2. In particular, the fragments are shown in SEQ ID NOs: 3, 10, 11, 17, and 25-37 and plasmid pJJ36-J. In addition, the specific variants of SEQ ID NO: 2 are listed as SEQ ID NOs: 15 or 16. The specification further discloses that Applicants discovered, using conventional and long-distance PCR analysis, that the HMW polypeptide is present in all *Chlamydia* sample strains tested, including serovars B, Ba, D, E, F, G, H, I, J, K, L_1, L_2 and MoPn and in *C. pneumoniae*. *See* specification at page 53, lines 19-29.

Moreover, the specification provides clear and unambiguous guidance to the methods of making such fragments or variants, describing at page 8, line 3 to page 9, line 25, and thus a person of ordinary skill in the art can make the fragments and variants without undue experimentation. In particular, the specification describes methods for obtaining variants, derivatives, or analogs of the claimed polypeptides by manipulating

the nucleic acid sequences, *e.g.*, *in vitro* site-directed mutagenesis, at page 8, lines 25-29 and by manipulating the amino acid sequences at page 8, line 30 - page 9, line 25. Thus, on the basis of the specification and the knowledge in the art, one of ordinary skill in the art would know, without undue experimentation, how to make nucleic acid or amino acid substitutions, deletions, insertions, or modifications.

Furthermore, the technology of making antibodies or antigen binding fragments thereof which specifically bind to a polypeptide is clearly described at page 24, and such technology is also well known and readily available to a person of ordinary skill in the art. In addition, the variants of SEQ ID NO: 2, SEQ ID NOs: 15 or 16, are naturally occurring, and antibodies thereto would inherently be useful; indeed, the sequence of *C. trachomatis* HMW protein of other serotypes will vary and antibodies which bind to those are useful as well. The specification further describes that the antisera generated against a purified recombinant HMW protein cross react with a protein of an apparent molecular weight of 105-115 kDa from *C. trachomatis* serovars B, F, L2, and MoPn, and *Chlamydia pneumoniae*. *See* specification at page 61, lines 30-33.

The Examiner has further alleged that "even a single amino acid substitution or what appears to be an inconsequential chemical modification, will often dramatically affect the biological activity of a protein" and that "[p]roteins with replacement of single amino acid residues may lead to both structural and functional changes in biological activity and immunological recognition." Office Action at page 11.

Applicants respectfully assert that loss of biological activity is out of the scope of the claimed subject matter. Claims are directed to an isolated antibody or antigen-binding fragment thereof which specifically binds to a specific sequence, and an

antibody which specifically binds to a polypeptide can be raised irrespective of the polypeptide's biological activity. Insofar as a particular sequence of polypeptide is known whether or not it has a specific biological activity, a person of ordinary skill in the art can make an antibody or antigen binding fragment thereof that specifically binds to the sequence. The court in *In re Wands* specifically stated that "methods for obtaining and screening monoclonal antibodies were well known in 1980" and that "[t]here was a high level of skill in the art at the time when the application was filed [which was in 1980] and all of the methods to practice the invention were well known." *In re Wands*, 858 F.2d at 731-736, 8 USPQ2d at 1403-1404. As of October 1997, the priority date of the present application, screening for an antibody or fragment thereof was a routine practice readily available in the art and, as such, no undue experimentation is required. Furthermore, as stated above, the specification incorporated by reference in the entirety the methods described in *Antibodies A Laboratory Manual* (E. Harlow, D. Lane, Cold Spring Harbor Laboratory Press, 1989). A working example of preparing antibodies to HMW protein or fragments thereof is found in Example 11 at page 61 of the specification as filed.

As such, a person of ordinary skill in the art possesses the knowledge of the disclosed or otherwise known methods of making and screening the polypeptides consisting of an amino acid sequence 95% identical to SEQ ID NO: 2 as disclosed in the specification. Such person of ordinary skill in the art also knows methods of producing or raising an antibody against the polypeptide, without undue experimentation. Therefore, the enablement requirement is fully satisfied. *In re Wands*, 858 F.2d at 738, 8 USPQ2d at 1404; *Ex parte Mark*, 12 USPQ2d 1904, 1906-07 (B.P.A.I. 1989).

Accordingly, reconsideration and withdrawal of the enablement rejection under 35 U.S.C. § 112, first paragraph, is respectfully requested.

VIII. The Rejection Under 35 U.S.C. § 102 Is Traversed

The Examiner has rejected claims 26 and 27 under 35 U.S.C. § 102(b) as being anticipated by Caldwell *et al.*, *Infection and Immunity*, 31(3):1161-76 (1981) ("Caldwell") as evidenced by Mygind *et al.*, *FEMS Microbiol. Lttrs*, 186:163-169 (2000) ("Mygind"), ATCC accession No. VR-902B *Chlamydia trachomatis* (Busacca) Rake, Lymphogranuloma venereum (LGV II) strain 434 ("ATCC"), or Pal *et al.*, *Infection and Immunity,* 65(8):3361-3369 (1997) ("Pal").

Claims 26 and 27 have been canceled, rendering rejection of these claims moot. Insofar as this rejection applies to newly-added claims 29 to 59, Applicants respectfully traverse. The Examiner has alleged that Caldwell discloses "antibodies specifically binding to isolated chlamydial outer membrane complexes (COMC) of *C. trachomatis* serovar (see page 1163 right column through 1164, left column and Table 1)." Office Action at page 13. The Examiner has alleged that the antibody claimed in the present invention is inherently present in the antibody preparation against chlamydial outer membrane complexes ("COMC") of *C. trachomatis* serovar because the polypeptide comprising an amino acid sequence of SEQ ID NO: 2 is inherently present in the isolated COMC.

Anticipation requires that all the elements and limitations of the claims are found, either explicitly or inherently, within a single reference. There must be no difference between the claimed invention and the reference disclosure as viewed by one of ordinary

skill in the art. *Scripps Clinic & Research Fdn. V. Genentech*, 927 F.2d 1565, 1576 (Fed. Cir. 1991).

Applicants assert that Caldwell fails to meet all the elements and limitations of the claims. Applicants respectfully point out that Caldwell has not raised an antibody or antiserum against the polypeptide consisting essentially of SEQ ID NO: 2 nor the isolated COMC. Caldwell did raise an antibody or antiserum only against MP39.5 ("MOMP") of *C. trachomatis* L2 serovar, a different protein. *See* page 1163 right column through 1164, left column and Table 1. Accordingly, Caldwell does not anticipate the newly added claims 29-59. Even assuming, *arguendo*, that Caldwell disclosed antibodies against the isolated COMC, it merely represents a broad genus of antibodies relative to antibodies that specifically bind to SEQ ID NO: 2. A genus may not anticipate a species. *Eli Lilly & Co., v. Board of Regent of University of Washington*, 334 F3d 1264, 1270, 67 U.S.P.Q.2d 1161, 1165 (Fed. Cir. 2003). Applicants respectfully request that the rejection under 35 U.S.C. § 102(b) as it applies to claims 29 to 59, be reconsidered, and further that it be withdrawn.

IX. Conclusion

All of the stated grounds of objection and rejections have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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